

## T02D03 – (2.3) Electron Arrangement

Name \_\_\_\_\_

## 1. 2.3.1 Describe the electromagnetic spectrum. (2)

a. Diagram a simple sinusoidal wave, noting the relation of magnetic to electric waves:

b. Define each of the following:

i. Wavelength:

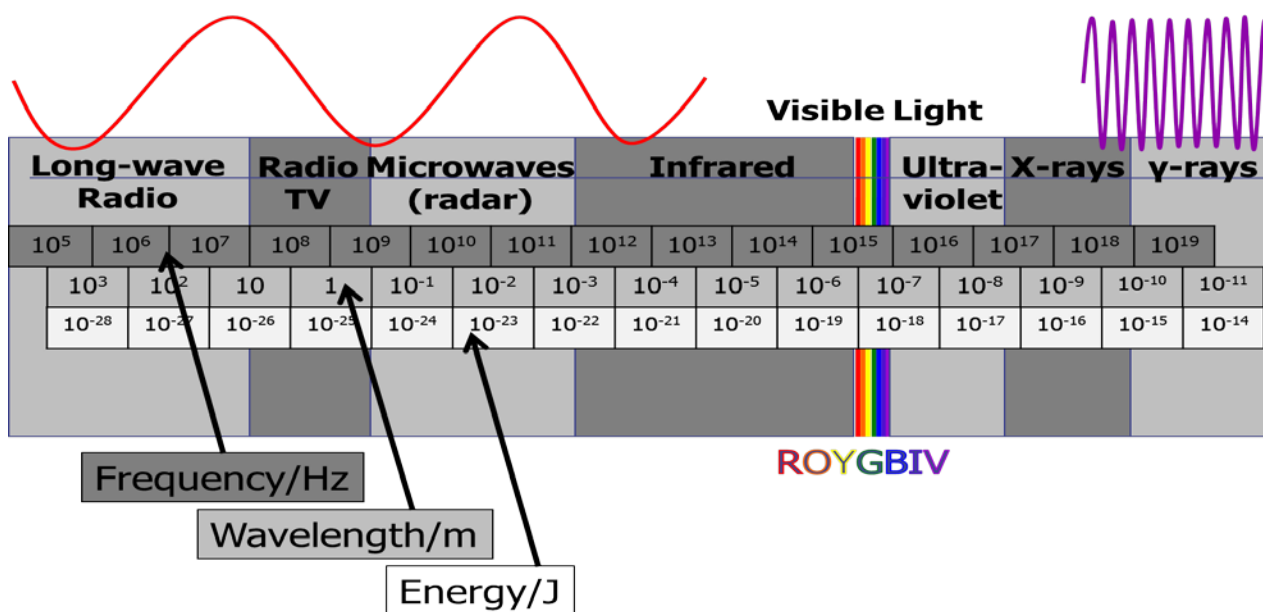
ii. Frequency:

iii. Speed:

iv. Wave Equation:

v. Diagram a simple wave using wavelength and demonstrating two relative frequency differences

vi. Be sure to understand the following electromagnetic spectrum. Label the area of highest energy:



c. Show Planck's constant equation and label each of the variables (with units). Now you have two models of describing light, what are they?

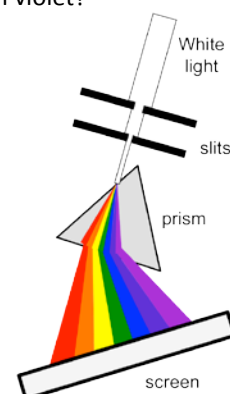
## 2. 2.3.2 Distinguish between a continuous spectrum and a line spectrum. (2)

a. White light:

b. Continuous Spectrum:

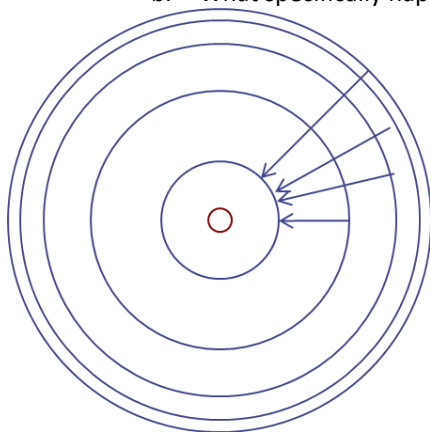
c. Line Spectra:

- d. In the provided diagram of light separating through a prism, why is red deflected less than violet?



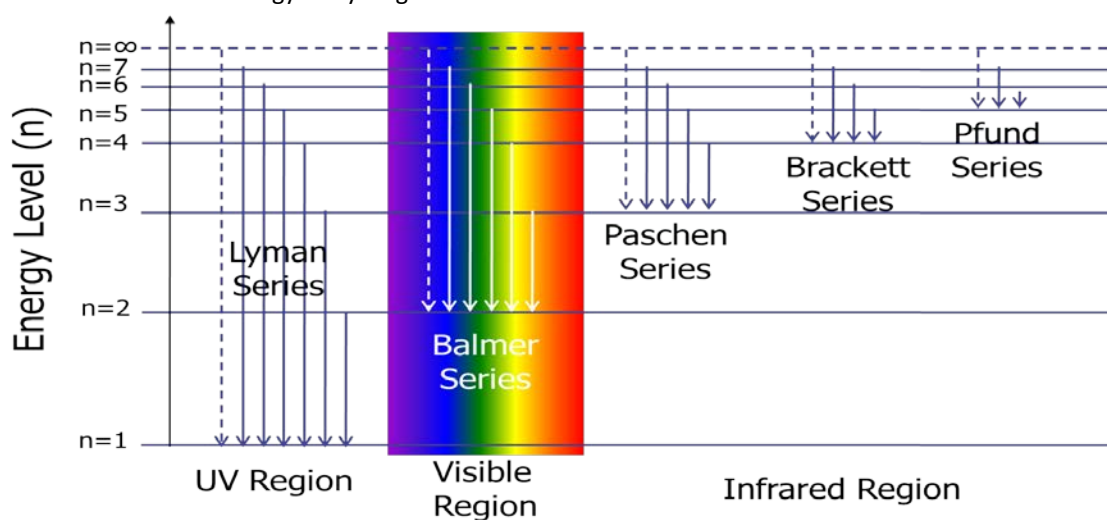
3. 2.3.3 Explain how the lines in the emission spectrum of hydrogen are related to electron energy levels. (3)
- Bohr's theory was based on evidence for energy levels being present within the atom, this means that:
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    - 
    - 
    -

- b. What specifically happens as electrons fall back from an excited state?



- i. What does the energy difference between each level correspond to? What is this called?

- c. The emission of energy as hydrogen falls back can be summarized below:



4. 2.3.4 Deduce the electron arrangement for atoms and ions up to  $Z = 20$ . (3)